CUBIC WORD SQUARES

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In a letter dated 16 Mar 2005, Anil proposed constructing word cubes consisting of six word squares, one on each cube face, with edge words shared by squares on adjacent faces. To avoid confusion with the word cubes introduced by Darryl Francis in the Aug 1971 Word Ways, I propose that these structures be called cubic word squares. (Darryl's n-by-n-by-n word cube consists of a set of 3n word squares oriented in three different planes, having a total of $3n^2$ words.)

It is easy to construct cubic word squares of size three. The six faces can be dissected into two three-face strips on which the word squares are inscribed. The simplest strategy is to assign consonants to the eight cube corners and the six centers of the cube faces, and the vowels to the remaining twelve positions on the midpoints of the cube edges. One can generate cubic word squares with 26 different words, four of which must be reversal pairs such as NEW-WEN or REP-PER.

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P E R  R A J  J O T     R E P  P A T  T A D
A T E  E W E  E R A     A G O  O D E  E V E
T A D  D E W  W E N     J O T  T A N  N E W
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A cubic word square of size four, with 38 different words, is somewhat more difficult, but can be done using words from the Second Edition of Merriam-Webster's Unabridged Dictionary. (Can someone do it using the Official Scrabble Players Dictionary or Webster's Collegiate?)

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R A T S  S E N T  T E E S     S T A R  R E N T  T S A R
E P E E  E D I E  E L S A     E R S E  E R I E  E I R E
N E M A  A G L A  A S E R     N E E D  D U E T  T E S S
T S A R  R E S T  T E R A     T E E S  S A R A  A R E T
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Would anyone care to construct a cubic word square of size five or larger?

The above squares are the analogue of double word squares. If one places six regular word squares (in which vertical words and horizontal words are the same) in the cubic word square, one is necessarily restricted to palindromic word squares of the SATOR-AREPO-TENET-OPERA-ROTAS type. (For other examples of size five, see Jim Puder's article "Some Sentential Palindromic Five-Squares" in the Feb 2004 Word Ways.) Below is an example of a regular cubic word square of size three, in which the only possible variation from face to face is in the central letter.

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P A T  T A P  P A T     T A P  P A T  T A P
A D A  A H A  A G A     A R A  A S A  A V A
T A P  P A T  T A P     P A T  T A P  P A T
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